

**CLAIMS:**

1. A method of processing seismic data including corresponding first and second modes of seismic energy, the method comprising the steps of:
  - a) processing a trace indicative of a first parameter of the seismic data acquired at a first receiver including at least events corresponding to the first mode with a trace indicative of a second parameter of the seismic data acquired at the first receiver including at least events corresponding to the second mode;
  - b) identifying an event in the processed data corresponding to partial mode conversion; and
  - c) obtaining information from the amplitude and/or the waveform of the event in the processed data corresponding to partial mode conversion.
2. A method as claimed in claim 1 wherein the second mode has been generated by partial mode conversion of the first mode at a boundary face of a layer of the earth.
3. A method as claimed in claim 1 or 2 wherein step (c) comprises normalising the amplitude in the processed data of the event corresponding to partial mode conversion.
4. A method as claimed in claim 3 wherein step (c) comprises normalising the amplitude in the processed data of the event corresponding to partial mode conversion relative to the amplitude of the processed data at zero time delay.
5. A method as claimed in claim 3 or 4 and comprising the further step of normalising the trace indicative of the second parameter relative to the normalised amplitude of the of the event corresponding to partial mode conversion.
6. A method as claimed in claim 1, 2, 3, 4 or 5 and comprising the further step of repeating steps (a), (b) and (c) for seismic data acquired at a second receiver, the second receiver not being co-located with the first receiver.

7. A method as claimed in any preceding claim wherein the first parameter of the seismic data is a vertical component of particle motion acquired at the respective receiver.
8. A method as claimed in claim 7 wherein the second parameter of the seismic data is a horizontal component of particle motion acquired at the respective receiver
9. A method as claimed in claim 7 wherein the second parameter of the seismic data is the component of particle motion acquired at the respective receiver in the direction between a source of seismic energy and the respective receiver.
10. A method as claimed in any of claims 1 to 6 wherein at least one of the first and second parameters of the seismic data is obtained by decomposing the seismic data acquired at the respective receiver.
11. A method as claimed in any preceding claim wherein step (a) comprises cross-correlating the trace indicative of the first parameter of the seismic data acquired at the first receiver with the trace indicative of the second parameter of the seismic data acquired at the first receiver.
12. A method as claimed in any of claims 1 to 10 wherein step (a) comprises deconvolving the trace indicative of the first parameter of the seismic data acquired at the first receiver from the trace indicative of the second parameter of the seismic data acquired at the first receiver.
13. A method of seismic surveying comprising the steps of: directing seismic energy propagating in a first mode towards a boundary face of a layer of the seabed such that partial mode conversion of the seismic energy into a second mode occurs at the boundary face; acquiring seismic data including the first and second modes of seismic energy at one or more receivers; and processing the seismic data according to a method defined in any of claims 1 to 12.

14. An apparatus for processing seismic data including corresponding first and second modes of seismic energy, the apparatus comprising:
- a) means for processing a trace indicative of a first parameter of the seismic data acquired at a first receiver including at least events corresponding to the first mode with a trace indicative of a second parameter of the seismic data acquired at the first receiver including at least events corresponding to the second mode;
  - b) means for identifying an event in the processed data corresponding to partial mode conversion; and
  - c) means for obtaining information from the amplitude and/or the waveform of the event in the processed data corresponding to partial mode conversion.
15. An apparatus as claimed in claim 14 and comprising normalising means for normalising the amplitude in the processed data of the event corresponding to partial mode conversion.
16. An apparatus as claimed in claim 15 wherein the normalising means are adapted to normalise the amplitude in the cross-correlated data of the event corresponding to partial mode conversion relative to the amplitude of the cross-correlated data at zero time delay.
17. An apparatus as claimed in any of claims 14 to 16 and comprising means for normalising the trace indicative of the second parameter relative to the normalised amplitude of the of the event corresponding to partial mode conversion.
18. An apparatus as claimed in any of claims 14 to 17 and comprising a programmable data processor.
19. A storage medium containing a program for a data processor of an apparatus as claimed in claim 18.